

## Claims

1. A linear guide device including a rail having a rail-side raceway surface on a lateral left face and a lateral right face, a slider having a front end face and a rear end face in the longitudinal direction of the rail and having slider-side raceway surfaces opposing to rail-side raceway surfaces, end caps each attached to the front end face and the rear end face of the slider, a plurality of rollers that roll along with the relative linear motion of the slider through circulation channels formed of rolling element rolling channels formed between the rail-side raceway surfaces and the slider-side raceway surfaces, rolling element returning channels formed in the slider along the longitudinal direction of the rail and direction changing channels for rolling elements formed in the end caps, and a plurality of retaining pieces each disposed between the rollers, in which the retaining pieces have a retaining piece body having a lateral left face and a lateral right face, a first arm portion extending from the lateral left face of the retaining piece body toward end faces of the two adjacent rollers and fitting a first guide groove formed to one of wall surface portions of the circulation channels, and a second arm portion disposed in parallel with the first arm portion on the lateral right face of the retaining piece body and fitting a second guide groove

formed to the other of the wall surface portion of the circulation channels, wherein

the height of the retaining piece body and the height of the arm portion are defined to such a height that satisfies  
5 the conditional relation:  $(H1 - H2)/2 < (Dw - W)/2$  where H1 represents the height of the retaining piece body in the direction crossing the axial direction of the roller, H2 represents the height of the first and the second arm portions in the direction crossing the axial direction of the roller, W  
10 represents the width of the first and the second guide grooves in the direction crossing the axial direction of the roller, and Dw represents the diameter of the roller.

2. A linear guide device including a rail having a rail-side raceway surface on a lateral left face and a lateral right face, a slider having a front end face and a rear end face in the longitudinal direction of the rail and having slider-side raceway surfaces opposing to rail-side raceway surfaces, end caps each attached to the front end face and the rear end face of the slider, a plurality of rollers that roll along with the relative linear motion of the slider through circulation channels formed of rolling element rolling channels formed between the rail-side raceway surfaces and the slider-side raceway surfaces, rolling element returning  
20 channels formed in the slider along the longitudinal direction  
25 channels formed in the slider along the longitudinal direction

of the rail and direction changing channels for rolling elements formed in the end caps, and a plurality of retaining pieces each disposed between the rollers, in which the retaining pieces have a retaining piece body having a lateral 5 left face and a lateral right face, a first arm portion extending from the lateral left face of the retaining piece body toward end faces of the two adjacent rollers and fitting a first guide groove formed to one of wall surface portions of the circulation channels, and a second arm portion disposed in 10 parallel with the first arm portion on the lateral right face of the retaining piece body and fitting a second guide groove formed to the other of the wall surface portion of the circulation channels, wherein

the height of the first and the second arm portions in 15 the direction crossing the axial direction of the roller is defined as a height that satisfies the conditional relation:  $0.2 \leq H2/Dw \leq 0.5$  where  $H2$  represents the height of the arm portions and  $Dw$  represents the diameter of the roller.

20 3. A linear guide device including a rail having a rail-side raceway surface on a lateral left face and a lateral right face, a slider having a front end face and a rear end face in the longitudinal direction of the rail and having slider-side raceway surfaces opposing to rail-side raceway 25 surfaces, end caps each attached to the front end face and the

rear end face of the slider, a plurality of rollers that roll along with the relative linear motion of the slider through circulation channels formed of rolling element rolling channels formed between the rail-side raceway surfaces and the 5 slider-side raceway surfaces, rolling element returning channels formed in the slider along the longitudinal direction of the rail and direction changing channels for rolling elements formed in the end caps, and a plurality of retaining pieces each disposed between the rollers, in which the 10 retaining pieces have a retaining piece body having a lateral left face and a lateral right face, a first arm portion extending from the lateral left face of the retaining piece body toward end faces of the two adjacent rollers and fitting a first guide groove formed to one of wall surface portions of 15 the circulation channels, and a second arm portion disposed in parallel with the first arm portion on the lateral right face of the retaining piece body and fitting a second guide groove formed to the other of the wall surface portion of the circulation channels, wherein 20 the length of the first and the second arm portions is defined to such a length that both ends of the first and the second arm portions are situated to the outside of a circle having the center at a central portion of the retainer piece body and having a diameter H3, where H3 represents the 25 distance between an outer lateral face of the first arm

portion and an outer lateral face of the second arm portion.

4. A linear guide device according to claim 3, wherein the length of the first and the second arm portions is defined to 5 such a length that both ends of the first and the second arm portions are situated to the outside of a circle having the center at a central portion of the rolling element rolling channel and having a diameter H4, where H4 represents the distance between a bottom of the first guide groove and a 10 bottom of the second guide groove.

5. A linear guide device according to claim 3, wherein a distance H5 between an end portion of the outer lateral face of the first arm portion and an end portion of the outer lateral face of the second arm portion, and a distance H6 between a central portion of the outer lateral face of the first arm portion and a central portion of the outer lateral face of the second arm portion are in a relation:  $H5 < H6$ .

20 6. A linear guide device according to claim 5, wherein the end portion of the outer lateral face of the first and the second arms is formed as an arcuate face convex to the bottom of the first and the second guide grooves.

25 7. A linear guide device according to claim 5, wherein the

end portion of the outer lateral face of the first and the second arm is formed as a tapered face relative to the bottom of the first and the second guide grooves.

5 8. A linear guide device according to claim 3, wherein a distance H7 between an end portion of an inner lateral face of the first arm portion and an end portion of an inner lateral face of the second arm portion, and a distance H8 between a central portion of the inner lateral face of the first arm portion and a central portion of the inner lateral face of the second arm portion are in a relation:  $H7 < H8$ .

10 9. A linear guide device according to claim 8, wherein the end portion of the inner lateral face of the first and the second arms is formed as an arcuate face convex to the end 15 face of the roller.

10. A linear guide device according to claim 8, wherein the end portion of the inner lateral face of the first and the second arms is formed as a tapered face relative to the end 20 face of the roller.

11. A linear guide device including a rail a rail-side raceway surface on a lateral left face and a lateral right 25 face, a slider having a front end face and a rear end face in

the longitudinal direction of the rail and having slider-side raceway surfaces opposing to rail-side raceway surfaces, end caps each attached to the front end face and the rear end face of the slider, a plurality of rollers that roll along with the 5 relative linear motion of the slider through circulation channels formed of rolling element rolling channels formed between the rail-side raceway surfaces and the slider-side raceway surfaces, rolling element returning channels formed in the slider along the longitudinal direction of the rail and 10 direction changing channels for rolling elements formed in the end caps, and a plurality of retaining pieces each disposed between the rollers, in which the retaining pieces have a retaining piece body having a lateral left face and a lateral right face, a first arm portion extending from the lateral 15 left face of the retaining piece body toward end faces of the two adjacent rollers and fitting a first guide groove formed to one of wall surface portions of the circulation channels, and a second arm portion disposed in parallel with the first arm portion on the lateral right face of the retaining piece 20 body and fitting a second guide groove formed to the other of the wall surface portion of the circulation channels, and has a minimum thickness at a portion put between the two adjacent rollers, wherein

plural kinds of retaining pieces each of different 25 minimum thickness are each interposed between each of the

rollers, and each of the retaining pieces is applied with a identification mark for identifying the kind thereof.

12. A linear guide device according to claim 11, wherein  
5 the retaining pieces are classified by colors on every kinds of different minimum thickness.